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Notice of Allowability	Application No.	Applicant(s)	
	10/687,126	GRAY ET AL.	
	Examiner	Art Unit	
	Ling-Siu Choi	1713	

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 02/16/2005.
2. ☒ The allowed claim(s) is/are 1-30.
3. ☒ The drawings filed on 16 October 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying Indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

1. This Office Action is in response to the Amendment filed February 16, 2005. Claims 1-27 are now pending.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CAR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms Tenley R. Krueger on March 2, 2005.

3. The application has been amended as follows:

In the Specification,

Page 1, line 18, after "(incorporated herein by reference)," insert -- now U.S. Patent No. 6,734,134, ";

[0054], line 3, delete secondarily occurrent "Ti(OC₂H₅)₃Cl";

[0054], line 4, change "Ti(OC₁₂H₅)Cl₃" to --Ti(OC₁₂H₂₅)Cl₃--;

In the Claim,

Claim 1, lines 2-3, change "contacting one or more olefin monomers together, at least

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one of the olefin monomers comprising ethylene," to --contacting ethylene and optionally one or more α -olefin monomers together--;

Claim 2, lines 1-2, change "wherein the monomers are ethylene monomers, and wherein the polymer is polyethylene" to --wherein the polyethylene polymer is a homopolymer of ethylene--;

Claim 3, line 1, change "polyethylene" to --polyethylene polymer--;

Claim 6, lines 1-2, delete ", wherein the soluble magnesium dialkoxide compound is a magnesium di(2-ethylhexoxide),";

Claim 6, line 4, change "and wherein. the" to --and wherein the--;

Claim 7, line 2, change "organoaluminum" to --organoaluminum preactivating agent--;

Claim 12, lines 2-3, delete ", and wherein the range of titanium to magnesium is 0:0.1 to 2:1";

Claim 14, lines 1-2, change "A process for olefin polymerization, comprising a) contacting one or more olefin monomers together" to --A process for α -olefin polymerization, comprising contacting ethylene and optionally one or more α -olefin monomers together--;

Claim 16, lines 1-2, change "wherein the monomers are ethylene monomers and the polymer is polyethylene" to --wherein the polyethylene polymer is a homopolymer of ethylene--;

Claim 17, line 1, change "polyethylene" to --polyethylene polymer--;

Claim 27, line 3, change "about 0:0.1" to --about 0:1--;

Add the following new claims:

--Claim 28 (new) The polymer of claim 1 wherein the soluble magnesium dialkoxide compound is a magnesium di(2-ethylhexoxide).--

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--Claim 29 (new) The polymer of claim 1 wherein the first chlorinating/titanating agent is $\text{Ti}(\text{OC}_2\text{H}_5)_3\text{Cl}$, $\text{Ti}(\text{OC}_3\text{H}_7)_2\text{Cl}_2$, $\text{Ti}(\text{OC}_3\text{H}_7)_3\text{Cl}$, $\text{Ti}(\text{OC}_4\text{H}_9)\text{Cl}_3$, $\text{Ti}(\text{OC}_6\text{H}_{13})_2\text{Cl}_2$, $\text{Ti}(\text{OC}_2\text{H}_5)_2\text{Br}_2$, or $\text{Ti}(\text{OC}_{12}\text{H}_{25})\text{Cl}_3$.--

--Claim 30 (new) The polymer of claim 14 wherein the first chlorinating/titanating agent is $\text{Ti}(\text{OC}_2\text{H}_5)_3\text{Cl}$, $\text{Ti}(\text{OC}_3\text{H}_7)_2\text{Cl}_2$, $\text{Ti}(\text{OC}_3\text{H}_7)_3\text{Cl}$, $\text{Ti}(\text{OC}_4\text{H}_9)\text{Cl}_3$, $\text{Ti}(\text{OC}_6\text{H}_{13})_2\text{Cl}_2$, $\text{Ti}(\text{OC}_2\text{H}_5)_2\text{Br}_2$, or $\text{Ti}(\text{OC}_{12}\text{H}_{25})\text{Cl}_3$.--

Allowable Subject Matter

4. Claims 1-30 are allowed.

5. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest references: Shamshoum et al. (US 5,817,591) and Buehler (US 5,037,789).

The present invention relates to a polymer and a process to prepare the polymer in the presence of a catalyst which is obtained by

i	contacting a soluble Mg(OR'')₂ with a halogenating agent to form a reaction product A
ii	contacting the reaction product A with a first halogenating/titanating agent to form a reaction product B
iii	contacting the reaction product B with a second stronger halogenating/titanating agent to form a reaction product C
iv	contacting the reaction product C with an organoaluminum preactivating agent to form a preactivated catalyst
v	heating the preactivated catalyst at a temperature of about 90°C to about 150°C for a time of about 30 minutes to about 24 hours

(summary of claim 1)

Shamshoum et al. disclose a polymer obtained in the presence of a catalyst made by the steps of (a) contacting **Mg(OR)₂** with a **halogenating agent** to form a halogenated product, (b) contacting the halogenated product with a hydrocarbon solvent to form a slurry, (c) adding 2-ethylhexanol to the slurry to solubilize the halogenated product into the hydrocarbon solvent to form a solution, (d) contacting the resulting solution with **titanium tetrachloride** to precipitate a solid product, (e) contacting the solid product with **titanium tetrachloride and di-n-butyl phthalate** to form an intermediate product, and (f) contacting the intermediate product with titanium tetrachloride to form a catalyst component (claims 1 and 6). Shamshoum et al. further disclose that a polymerization is carried out in the presence of the catalyst component, triethyl aluminum, CMDS, and α -olefin at 70°C for 60 minutes (col. 5, lines 43-51; col. 7, lines 54-59). However, Shamshoum et al. do not teach or fairly suggest an ethylene homopolymer or

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copolymer obtained in the presence of a catalyst made with a halogenating/titanating agent and a **stronger** halogenating/titanating agent.

Buehler discloses a polypropylene obtained in the presence of a catalyst produced by the steps of (a) contacting at least one hydrocarbon soluble magnesium compound with a halide-containing modifying compound and (b) further contacting with a **first titanium-containing compound** and a **second different titanium-containing compound**, wherein the first titanium-containing compound can be tetrahydrocarbyloxy titanium, hydrocarbyloxy titanium trihalide, dihydrocarbyloxy titanium dihalide, or trihydrocarbyloxy titanium halide; the second different titanium-containing compound can be titanium tetrahalide, hydrocarbyloxy titanium trihalide, dihydrocarbyloxy titanium dihalide, or trihydrocarbyloxy titanium halide (col. 1, lines 13-53; col. 7, lines 22-55; claim 1). However, Buehler do not teach or fairly suggest an **ethylene homopolymer or copolymer** obtained in the presence of a catalyst made with a halogenating/titanating agent and a **stronger** halogenating/titanating agent.

In light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.

L. S. Choi

**LING-SUI CHOI
PRIMARY EXAMINER**

March 3, 2005